How to use the chi2?

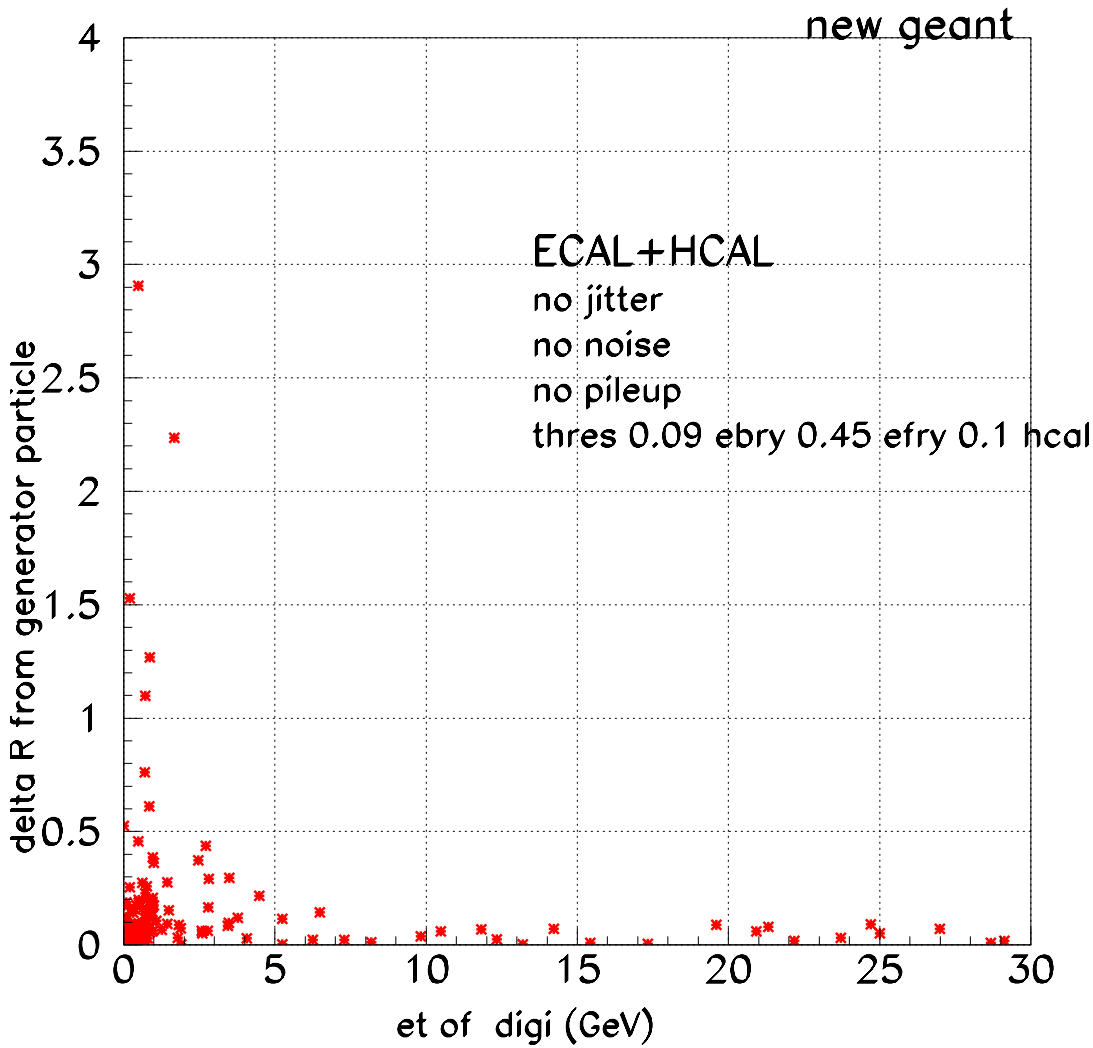
Want to choose chi2 cut to optimize the energy resolution in the presence of noise and pileup.

Start with 30 GeV pions at eta = 0.4 to start…

in the following plots “old geant” =cms116

“new geant” =cms116 with new tz files for hcal, vcal, esfx

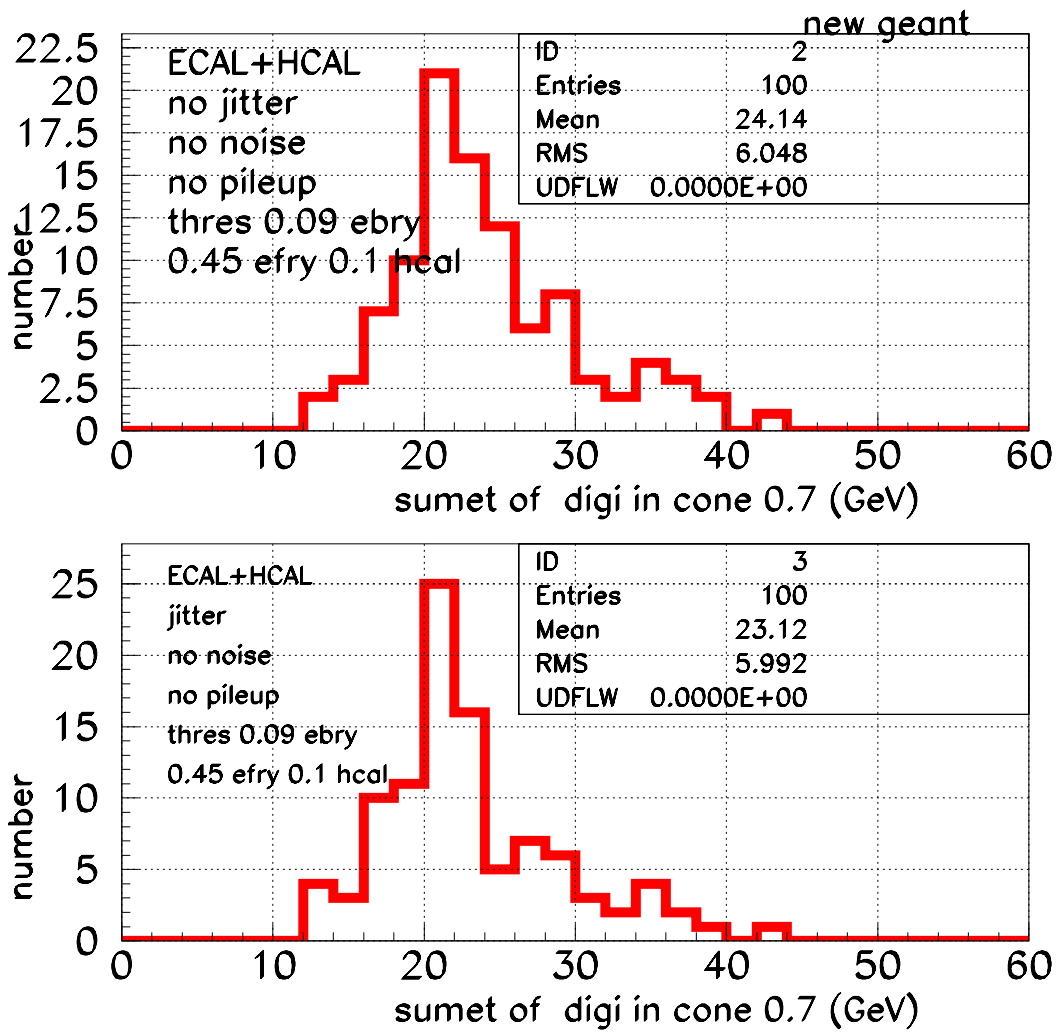
How big?



Use cone of 0.7 around generator particle for studies.

Look at digis in cone.

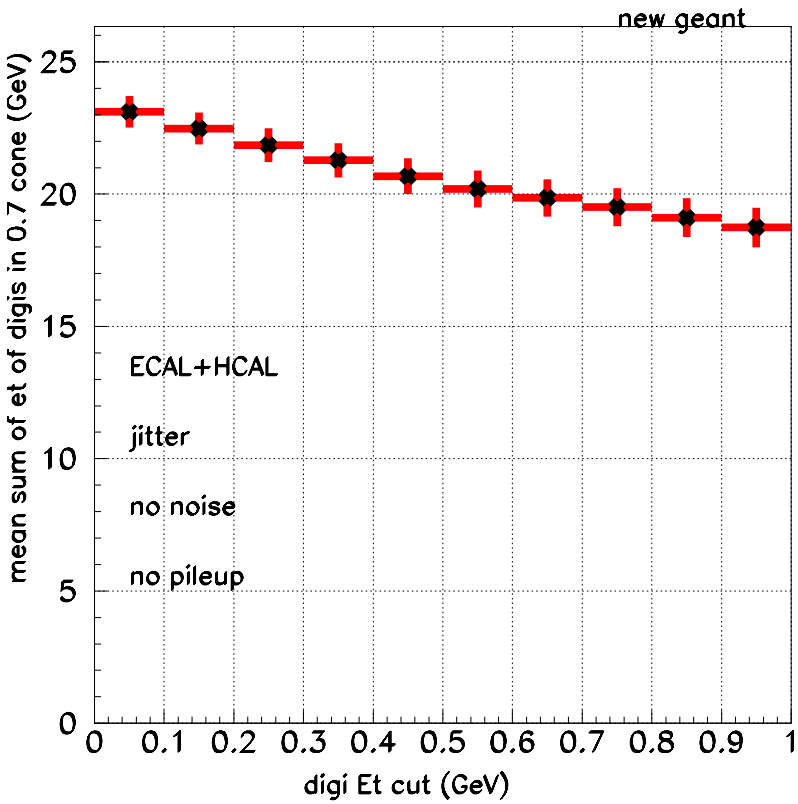
No noise, no pileup

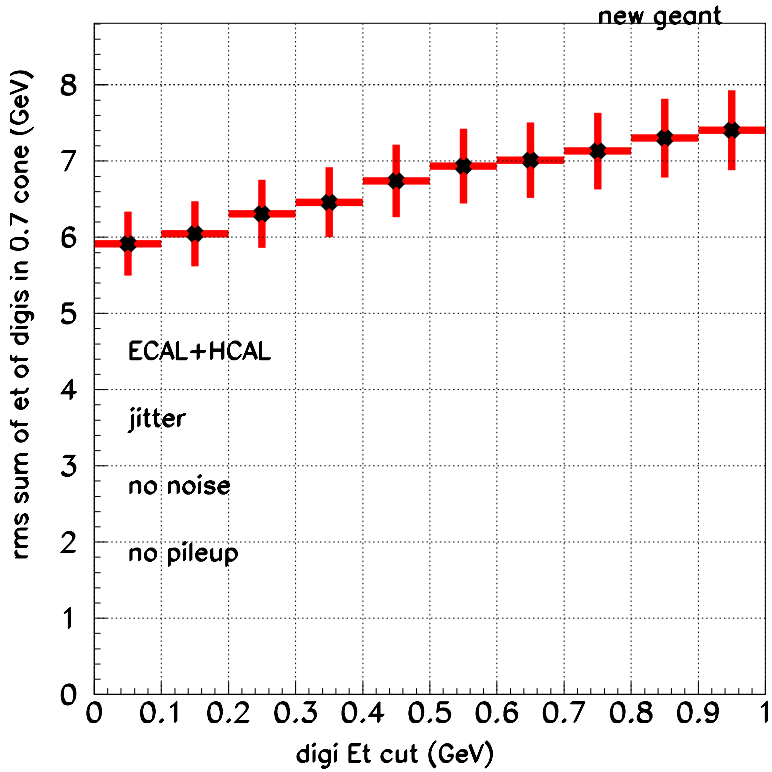


Jitter does not seem to affect energy resolution

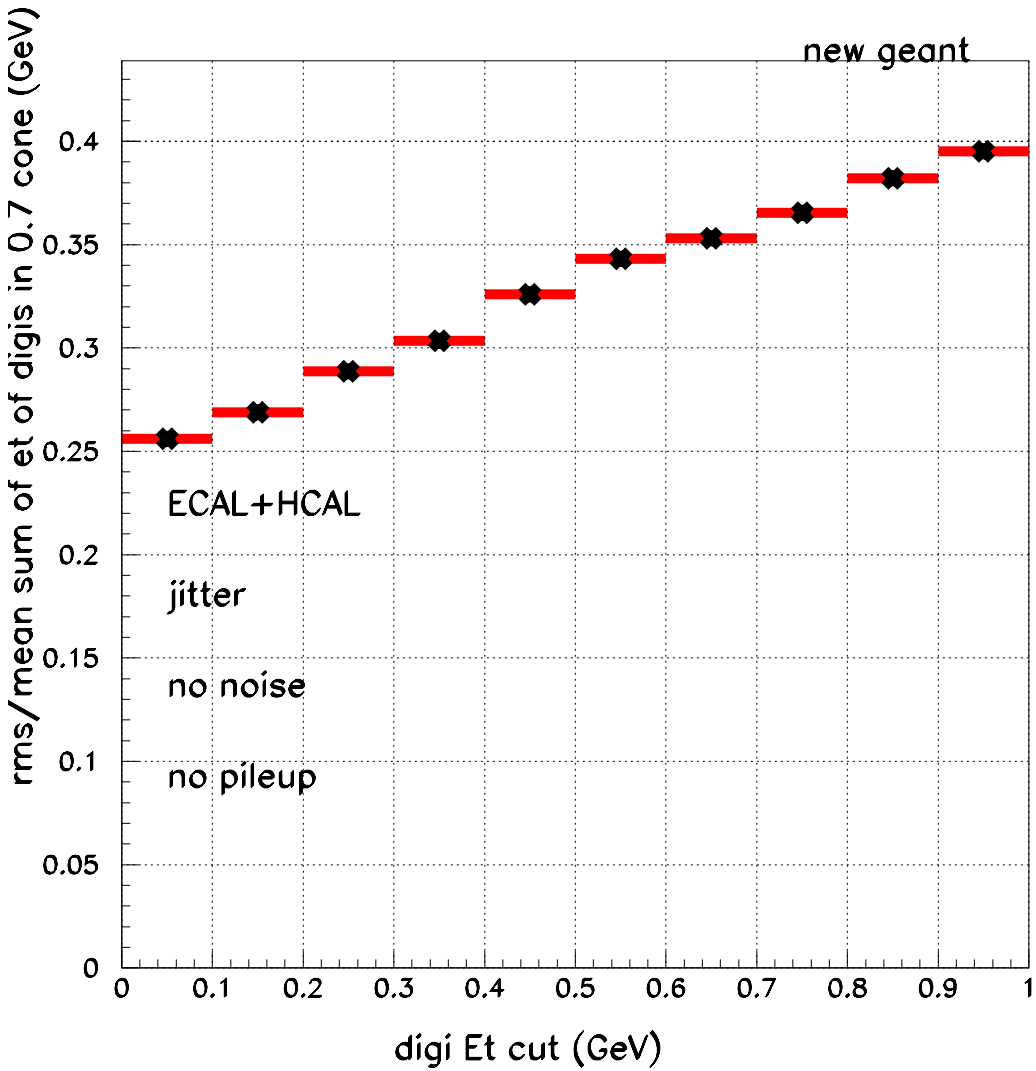
Digi et cut

Before we check the chi2, let's see how the resolution depends on a noise threshold on the digis



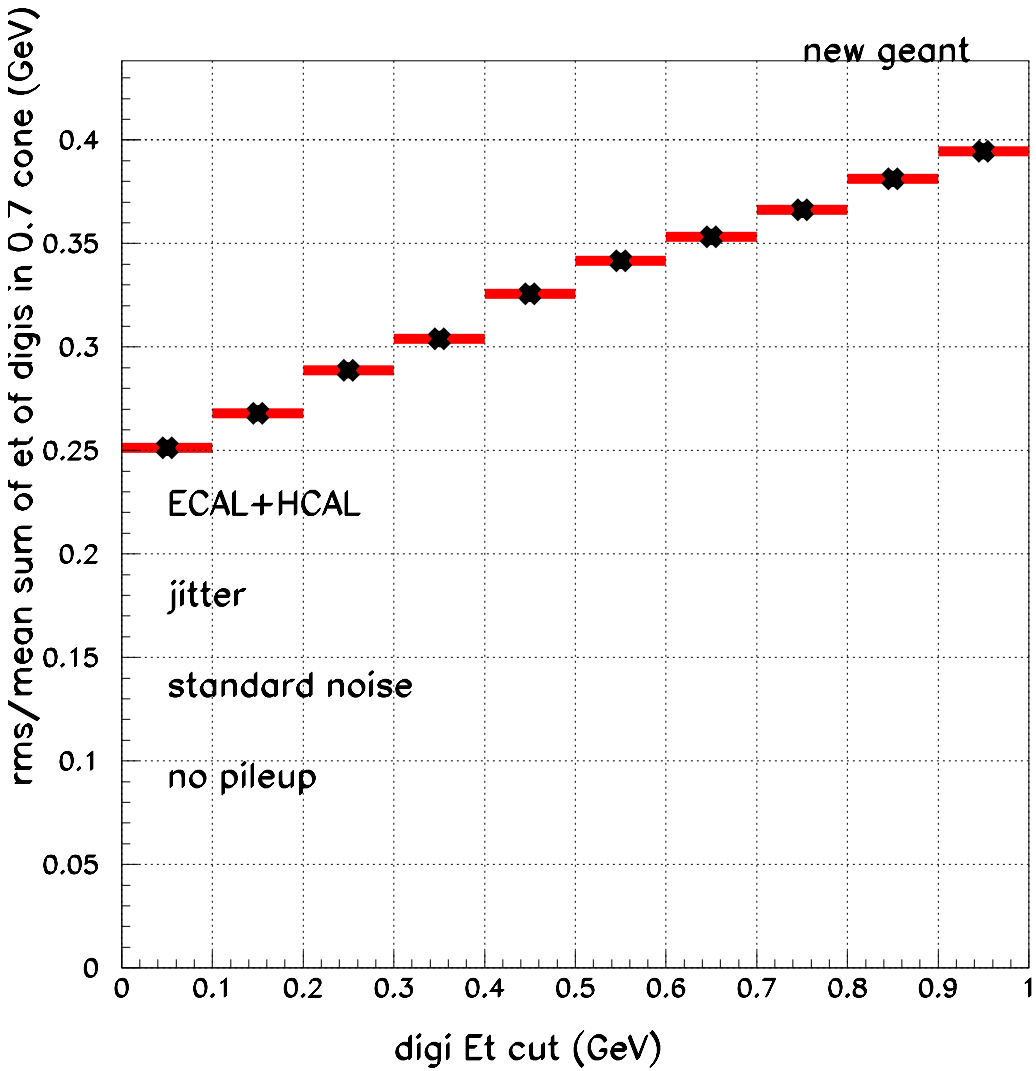


Digi Et Cut



With no noise and no jitter, want lowest et threshold on digis

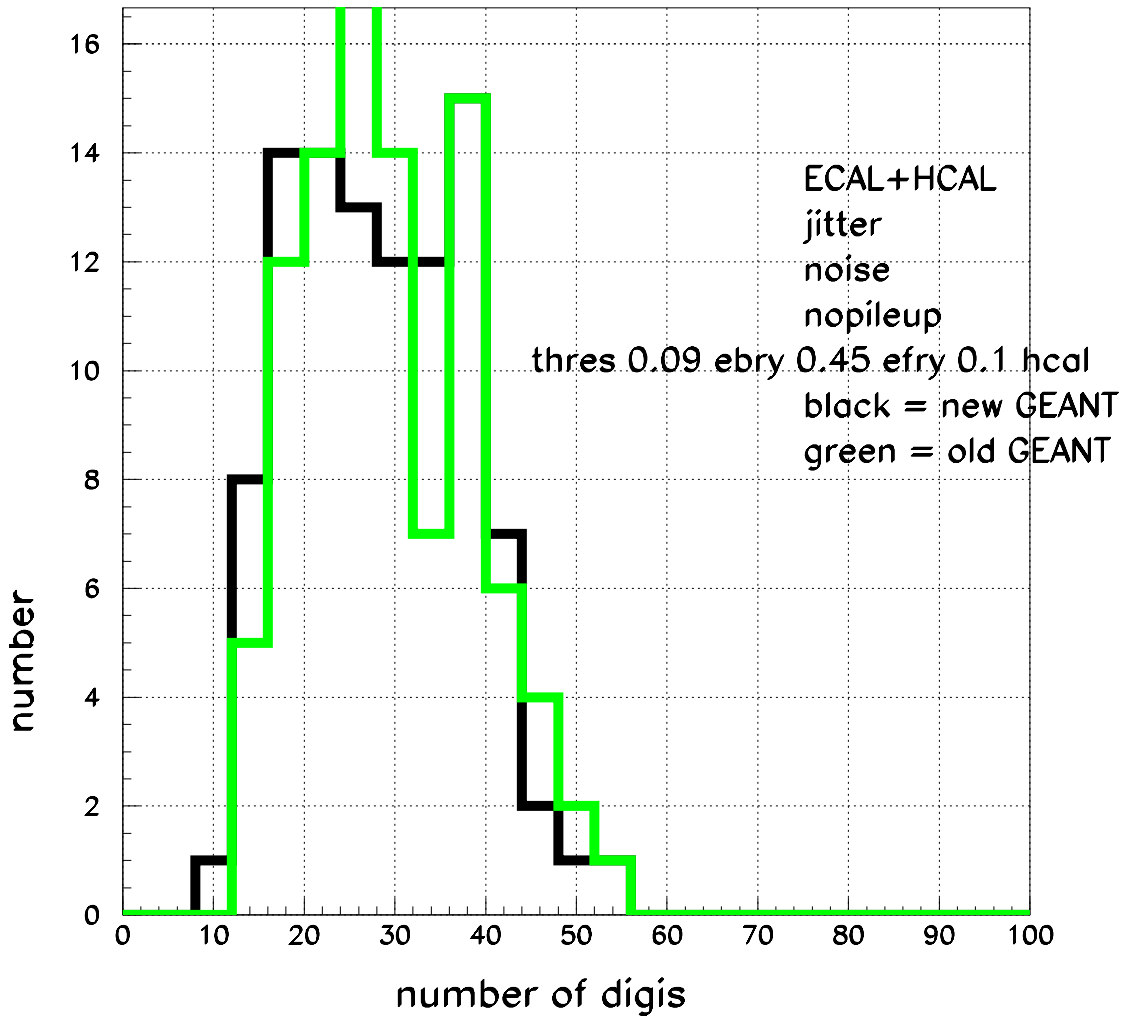
Digi Et Cut



With level of noise in current simulation, same conclusion

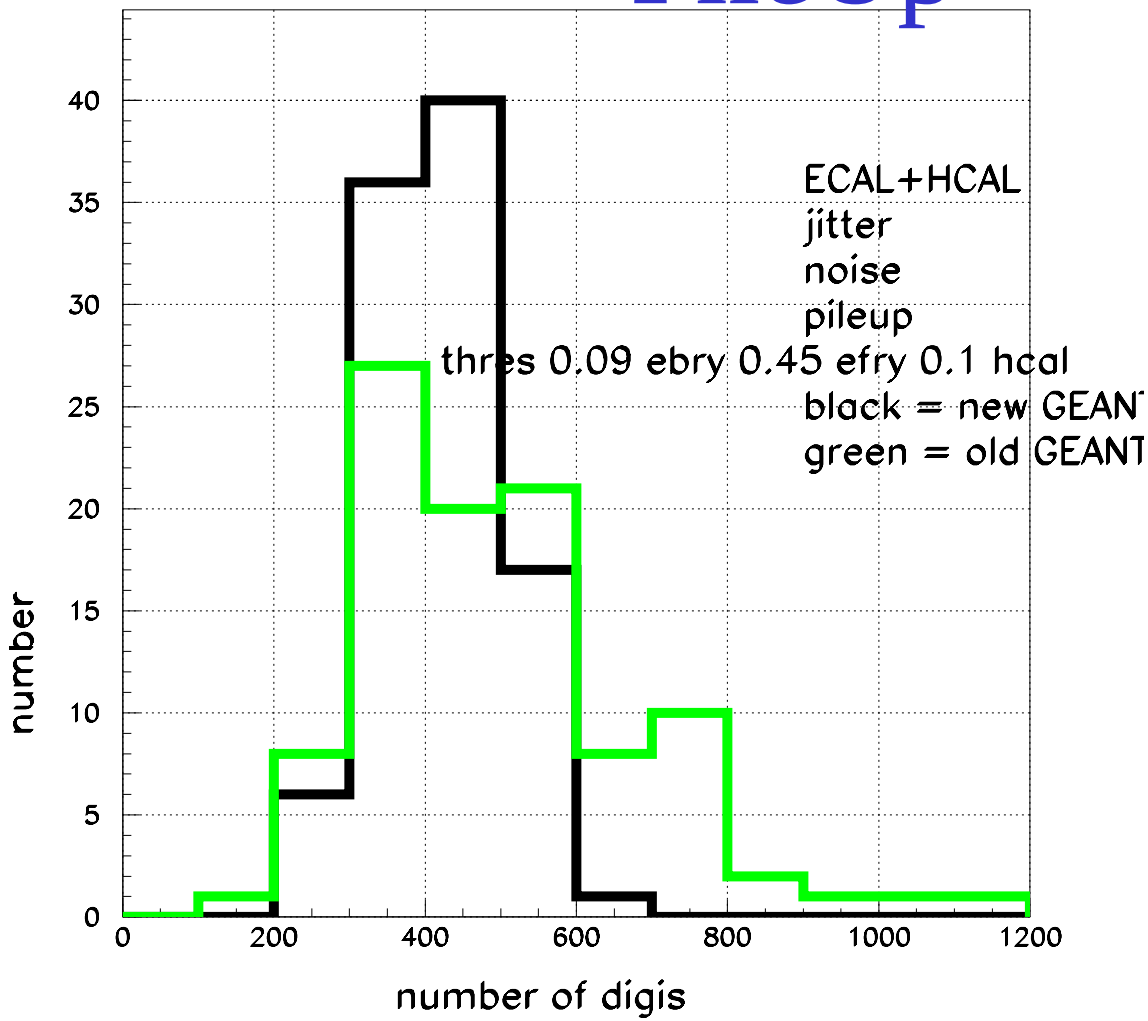
PileUp

tried to do pileup with new tz files, but ran into problem...



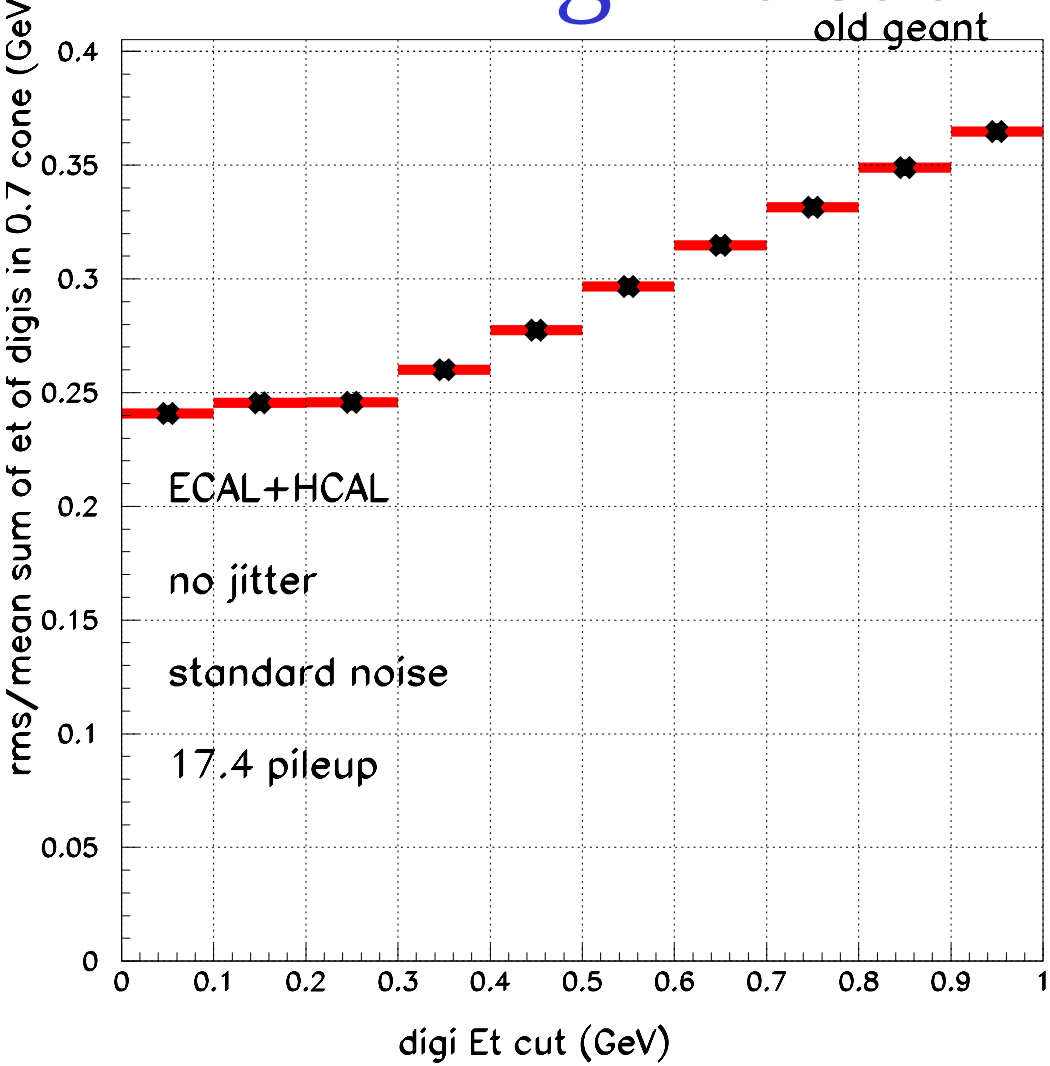
for single particles, ndigi looks same for new, old tz files

PileUp



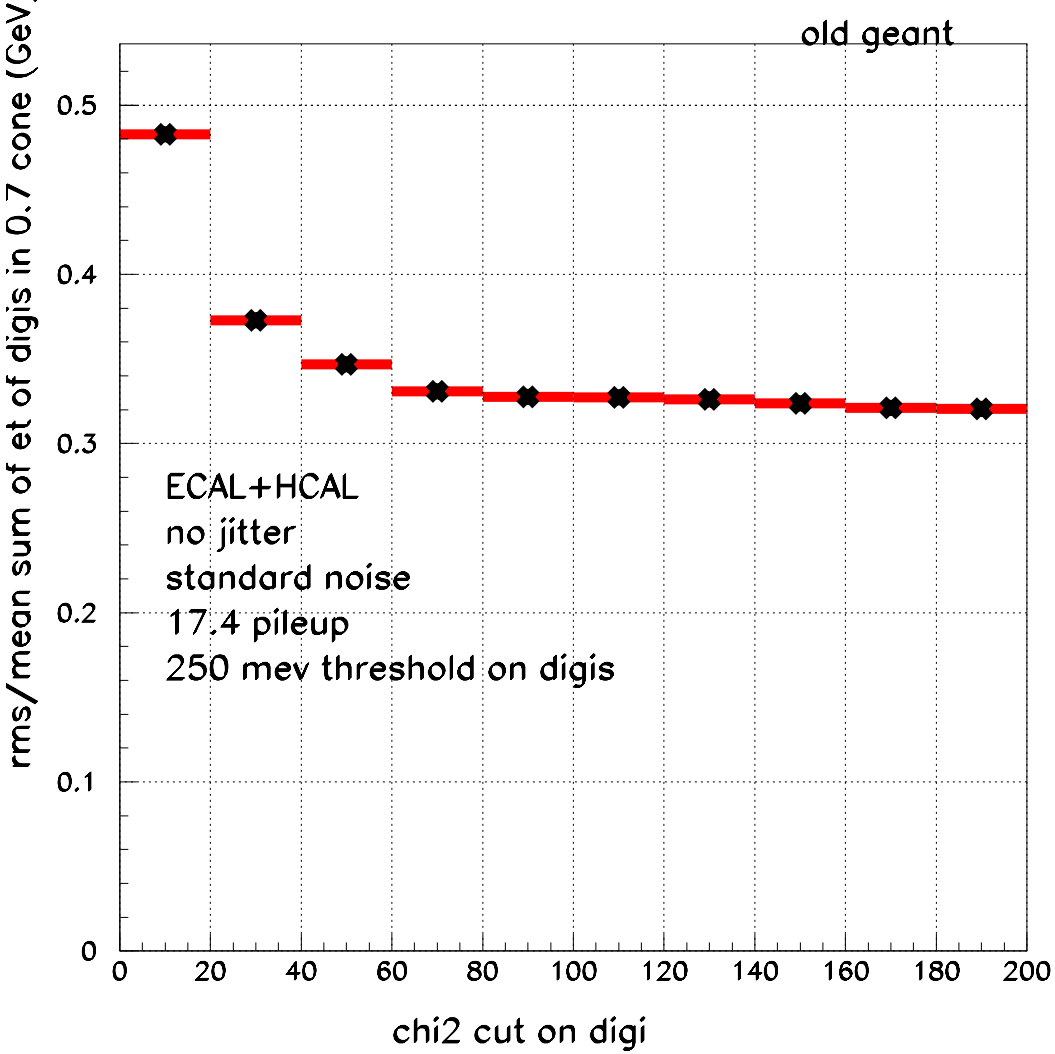
after pileup, though, events from new tz files have much fewer digis. I got the min bias files for the old tz files from an “official” area, but tried to make the ones for the new myself… I guess I’m doing something wrong. since jitter seemed to be a small effect, ignore it for now and use old tz data samples

Digi Et cut



With pileup, can use up to 250 MeV noise cut (though, why is cut=250 better with pileup than without…)

chi2 cut



loosening the chi2 cut does not hurt resolution. (ie, digis from out-of-time events don't hurt resolution, don't need to reject them).
don't need chi2 cut? (probably don't need bunch id in L1?)

what now?

1)get somebody else to make the events for me, to check…

2) check et, rapidity depedence of conclusions

3) try for jet resolution

4) met?